among whom (as our author shows) the Jesuit missionaries found and did not make a system of communism (pp. 42 seq.). In nearly all the instances of this class the sense of property was most strongly developed in regard to the hunting ground of the tribe, though (in the case of the Iroquois, &c.) it embraced the Long Houses of the clans of the tribe, an anticipation of Fourier's phalansteries. The differentiation of the clan from the tribe is ascribed to the growth of the taste for property itself (cf. p. 365). Letourneau would explain the present universality of human sympathy as a bequest to us from the days when all property was common (p. 57). The republican organization passed into the monarchical, where the tribe was governed by its chief (pp. 56 seq.). This political change was rather an effect than a cause of coincident industrial changes, especially the introduction of private property in slaves and women. "A comparison of the American tribes, placing them in a graduated series from the primitive system of communistic equality upward, plainly shows that, at least in this part of the world the establishment of aristocracy and hereditary monarchic power has merely crowned an economic evolution, whereof the point of departure was the institution of slavery, and the consequent development of agriculture, whence arose the rupture of primitive equality, creation of exchangeable values, development of private property, contrast between rich and poor, foundation of castes, and hereditary succession" (p. 61). This passage, amongst others, betrays the tendency—fashionable in some quarters at the present time—to regard all social development as due mainly, if not wholly, to economic causes. Not that economists by profession are *gratæ personæ* to our author. On the contrary, they are only mentioned to be rebuked, and their doctrines only to be caricatured (see pp. 91, 96, cf. 120, 124, &c.). But, as by some sections of German Socialists, so by Letourneau, we are given to understand that the politics, religion, and general character of a society are determined by the conditions of industry and the terms of property therein prevailing, while no sufficient allowance is made for the reaction of the former set of phenomena on the latter.

To sum up: at this third stage in the development from savagery (the early monarchical system), the idea of personal property is extended from weapons and tools which a man has made, to the trees which he has planted, and then to the plot of ground he has cleared and sown. After that the idea of private property may be considered to be full formed and definitely launched on its modern career of development (p. 72). The great cause of private property is agriculture. Where there was only pasture, as with the Hottentots, the private property was only in cattle, women, and children (p. 79). Agriculture brings us to extended forms of slavery, and to forms of property and modes of valuing and exchanging it that approach more and more to modern ideas.

We need not follow our author into the *minutiæ* of his account of "primitive monarchies" and empires. He gives a survey of mankind from China to Peru, and from the earliest times to the period of Roman, feudal, and modern civilization. The earliest stages of the development are (rightly enough) treated more fully than the later, the later being the more generally known. The differentiation of clan from tribe and of family from clan, the formation of village communities for the purpose of agriculture, the introduction of inheritance, and of private property in estates, are all traced out in chapters that are full of interest even when not above cavil.

Prof. Letourneau has perhaps been too ready to point a moral for the benefit of his own generation. But after all he gives his readers the facts, and they may find their own moral, which may or may not be his. One of the best instances where the materials presented seem to justify a different moral than the one drawn from them is that of the *dessa* or village community of Java. It is pronounced to have excellent results, particularly in increasing population (p. 121), and is contrasted with "the selfish African system" (p. 122); but by our author's own account it is a combination of private and collective property, not an example of the latter by itself (cf. pp. 114, 115).

The book is, we may presume, translated from the French; and this will account for the use of "alienist" for "lunacy doctor" (p. 370), "disengaging" for "analyzing" (p. 373), and "salaried" for "wages-earning" (p. 375). But, as a rule, the language is correct and clear English.

J. B.

LEAPER'S "OUTLINES OF ORGANIC CHEMISTRY."

Outlines of Organic Chemistry. By Clement J. Leaper, F.C.S. Specially written for Schools and Classes connected with the Department of Science and Art. (London: Iliffe and Son, 1892.)

THIS little work is intended, as the title states, for the use of beginners. But the author has made the way of beginners hard, by leaving in his pages the largest collection of misprints and other slips which we recollect to have met with in so small a compass.

On the very first page, in the opening lines, there occurs a wrong formula for urea; and the book ends with a wrong formula for aldehyde-ammonia. We do not propose to convert this notice into a table of errata; but the following may be given as illustrating the sort of guidance which the beginner may expect. On p. 75, in the brief space of three lines, we meet with "$(COOH_2)$," "$C_3H_5(OH_3)$" and "$C_3H_5(OH_2)COOH$," as representing respectively oxalic acid, glycerin, and—monoformin! The blunder, in each case, consists, of course, in placing a coefficient inside instead of outside the bracket; but we doubt whether, even with this correction, the last expression, with its carboxyl-group in place of the group O.CHO, would be recognized, even by an experienced chemist, much less by a beginner, as representing monoformin.

Blunders, due to carelessness, are not confined to formulæ. Thus we find: "Pure white precipitate of silver *oxide* (p. 13), whereas the context shows that silver *chloride* is meant; "*ethene* dichloride, $C_2H_2Cl_2$" (p. 37); "lead the gas into lime water, and note the formation of insoluble *carbon dioxide* (p. 51); "by the further chlorination of methyl chloride we get *ethylidene* chloride" (p. 67); whilst, on p. 99, "grains" is twice given instead of "grams." But the worst blunder we have met with occurs on p. 109, where, possibly owing to a transposition of the pages of the author's manuscript, the explanations

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which should follow Experiment 112 (Preparation of Ethyl Nitrite) have been moved on by a whole page, and made to follow Experiment 115 (Preparation of Nitro-ethane). The utterly bewildering effect of this jumble, which is enhanced by the unexpected re-entrance of the subject of nitro-ethane in the middle of a paragraph a little later on, cannot be realized without reading the passage.

The work is intended to combine practical with theoretical instruction. The selection of experiments is, on the whole, judicious, and the practical directions are generally good. This is not to be wondered at, as the author has evidently, in these points, followed pretty closely Prof. Emerson Reynolds's "Experimental Chemistry," even to such details as the substitution of a tin oil-can for a distilling flask (p. 99), or a peculiarity in the bending of a tube (p. 74), and to the reproduction of some of the illustrations—in every case without acknowledgment. Prof. Reynolds is not, however, responsible for the illustration on p. 17, in which the distillate from a Liebig's condenser is represented as falling from a considerable height into a flask placed below.

It is not true that (p. 12) "every organic compound containing nitrogen will, when fused with metallic sodium, convert the latter into sodium cyanide." Diazo-compounds do not yield any cyanide; and compounds containing sulphur as well as nitrogen form thiocyanate. Nor is heating a cyanide with excess of concentrated sulphuric acid (p. 76) a method of distinguishing it from a formate.

The author's style is occasionally slovenly, and sometimes worse: "Observe how the fact that oxalic acid so readily split up into CO, CO_2 and H_2O support (*sic*) this graphic formula for it" (p. 117).

On the whole, we suspect that teachers will prefer a text-book which calls for fewer marginal corrections.

OUR BOOK SHELF.

An Introduction to the Study of Botany, with a special chapter on some Australian Natural Orders. By Arthur Dendy, D.Sc., and A. H. S. Lucas, M.A. Small 8vo, 272 pages with about 30 pages of woodcuts. (Melbourne and London: Melville, Mullen and Slade, 1892.)

THE authors of this little work are both teachers of Natural Science in the University of Melbourne and it is specially intended for the use of students in Australia. With this object in view it would have been better perhaps to have selected common Australian types to illustrate the life history of the great divisions of the vegetable kingdom; but *Pinus* is taken as a representative of gymnosperms and *Vicia* of angiosperms. Whether these plants are both easily procurable in Australia we are unable to say, but even in that case it would have been better to have taken native plants. Possibly the preparation of illustrations may have influenced the authors, for they are largely, in the first part, "modified," "simplified," or "adapted" figures from well-known books, or they are simply copied. Taken as a whole, we do not doubt that this primer will prove useful to students, but it needs much revision to make it what it ought to be. Here and there, where we have tested it, we have found serious shortcomings. Take for example the account of the divisions of the vascular cryptogams.

"1. *Filicineæ.*—These are the ferns which constitute a very large and interesting subdivision. The full account already given of the common bracken renders a detailed description unnecessary in this place. There are two principal subdivisions of the *Filicineæ;* the homosporous, which produce only one kind of spore, and the heterosporous, which produce large megaspores and small microspores. The former include all the ordinary ferns and are again subdivided into six 'families,' of which the Polypodiaceæ are the best known and most abundant, including most of the common ferns, such as Pteris."

One would have expected a word or two respecting the heterosporous group—the *Rhizocarpeæ*, with some mention of *Marsilea*, so memorable in the history of Australian exploration; but the authors seem to have come to grief between the older and newer classifications of vascular cryptogams, for in another place (p. 90) we read of "heterosporous ferns." The definition of the *Equisetineæ* contains no reference to the spores; and the description of the *Lycopodineæ* contains no information at all. It runs thus: "This group includes the club-mosses (*Lycopodium*) and the beautiful *Selaginella*, a plant frequently grown in conservatories for decorative purposes. They are all of rather small size, and are popularly spoken of as "mosses" owing to the general appearance of the plant with its numerous very small leaves."

Comment on such a description would be superfluous. In the classification of the cellular cryptogams, lichens are altogether left out, and are apparently not mentioned anywhere. In fact the same incompleteness and inexactness pervades the book, which opens with a eulogistic preface by W. Baldwin Spencer, Professor of Biology in the University of Melbourne. W. B. H.

A German Science Reader. (Modern German Series.) Compiled by Francis Jones, F.R.S.E. (London: Percival and Co., 1892.)

THE idea of introducing to English readers extracts from the works of many well-known German scientific authorities will be thoroughly welcomed. The author has brought together sixteen very interesting articles on several branches of science, supplemented with notes, in which difficult passages are translated, and a glossary of the technical terms not usually found in dictionaries. Among the articles we may mention, Electric Telegraphs by Bernstein; Ice and Snow by Kantz; Air by Müller; Aniline Dyes by Kekulé; Spectrum Analysis by Kirchhoff and Bunsen, &c. W.

More About Wild Nature. By Mrs. Brightwen. (London: T. Fisher Unwin, 1892.)

MRS. BRIGHTWEN'S book on "Wild Nature Won by Kindness" was so widely appreciated that she has been encouraged to prepare a second volume of the same general character. It speaks well for her knowledge of animals, and for her interest in their habits, that the new sketches are written in as fresh and bright a style as if she had never before occupied herself with the mass of subjects with which she deals. She is a careful and accurate observer, and all readers who care for natural history will find much to please them in the facts and impressions she records. The author's illustrations add greatly to the charm of the text.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

Arborescent Frost Patterns.

ON Sunday last, December 4, I observed a curious phenomenon, which I do not remember having ever seen before in the streets of London. Along the Euston Road, the Marylebone

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